

Report on the 12th Uniatec Congress

Moscow, 5-10 October 1976

By HARRY TEITELBAUM
and BERNARD HAPPÉ

The 12th Uniatec Congress was especially memorable for a number of reasons, some having to do with the excellence of the technical sessions and others having to do with the hospitality shown to authors, delegates and invited guests.

As guests of the USSR, they were met at the airport and guided through customs (no waiting) and driven to The Rossiya in chauffeured autos. (The Rossiya, with 3150 rooms, is said to be the largest hotel in the world.)

The meeting was notably well planned and organized by the Executive Director of the Congress, B. Belkin, Laboratory Chief of NIFKI. The technical sessions were held in the White Hall of the Central Cinema House (Dom Kino). The room was spacious, with excellent projection facilities and each session was well attended. The format of the program was similar to that of the SMPTE annual conferences.

The program was enhanced by technical visits to NIFKI and (on 8 October) to either Mosfilm Studios or the Ocyabr Motion Picture Theater.

The official languages of Uniatec are English, French, German and Russian. Simultaneous translation for the sessions was available through the use of portable wireless receivers. Other especially thoughtful touches included the use of color-coded identification badges worn by officers, interpreters and staff of the organizing committee thus making it easy for anyone to get information or assistance quickly.

A rather unusual courtesy was the presentation to the guests of the hotel upon arrival of a gift of 50 rubles (about \$75) to cover breakfast and other incidental expenses during their stay.

Abstracts of all papers were printed in all four official languages, published and presented to each participant at the time of his registration. *Proceedings* of the Congress will be published as soon as possible with each paper being published in the language in which it was presented.

Social Events

The Congress social events included: a Performance at the Puppet Theater; an evening at the Bolshoi Theater; a visit to the Diamond Fund; a visit to the Armory; and the Reception held in honor of the participants of the

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Congress. The Ladies' Program included: Tea and Acquaintance Party; a sightseeing tour of the city; a trip to the Kremlin with a visit to the Armory; an excursion to St. Basil's Temple; and a visit to the Palace of Young Pioneers or to the House of Fashion. Other features of the program were: a visit to the TV Tower with a panoramic view of Moscow from a 1000-ft height; a visit to the Tretyakov Art Gallery and to Pushkin Museum of Fine Arts; and a visit to "The Novodevichy Convent" Museum.

A Press Bureau provided daily information bulletins of the Congress to representatives of the press, television, broadcasting and information agencies, and also arranged press conferences and interviews.

Upon the conclusion of the Congress, participants advised the Organizing Group representative of their travel plans and transportation was furnished to drive them to the airport.

Photo-Sonics Achievement Award

A presentation of the SMPTE Photo-Sonics Achievement Award for High-Speed Photography for 1976 was made to Dr. A. S. Dubovik by Kenneth Mason, SMPTE President (1975-76) at a special ceremony during the Conference. Ken Mason, Bob Gale and Denis Courtney represented SMPTE and Vladimir Trusko, Technical Director of Goskino, represented the U.S.S.R.

The officers of Uniatec and of the 12th Congress, all deserve praise for a job very well done.

HARRY TEITELBAUM

THE PAPERS PROGRAM

The program of papers submitted for the 12th Uniatec Congress undoubtedly represented a truly international forum on motion-picture science and technology, and with some fifty contributions from fourteen different countries actually given in the course of the sessions this was surely the most extensive field of topics ever to be covered at a Uniatec meeting.

It has long been recognized that by their organizational structure the Uniatec conferences provide the occasion for wide-ranging surveys on the position and future of film from a philosophical viewpoint, as well as the opportunity for advanced scientific and academic studies of specialized aspects.

But this year in Moscow the balance between theory and practice was well maintained, and a large proportion of papers dealt with currently applied technology, even with some substantially commercial presentations of new equipment.

The Stereo Cinema

Since the meeting this year was to be in Moscow, it was anticipated that one of the most interesting topics for outside visitors would be the present status of stereoscopic presentation in the cinema theater, a subject on which a great deal of theoretical study and technical development has been devoted in the USSR for many years past. Delegates' expectations were met by the opening paper of the conference, in which Dr. Komar presented a major review of the work now going forward on the application of holography toward large-screen presentation of motion pictures. The required parameters have been evaluated and a specific program for developing the required technology is in hand. Current work is based on the use of a film 70mm wide running at a speed of one meter per second, having a special thick emulsion coating within which the interference hologram images are formed in layers. Laser illumination of the original subject is used and the interference reference beam is generated within the optical system of the camera itself. Eventually for color photography, the subject illumination will be by three pulsed lasers to produce red, green and blue interference records.

On projection of the monochrome record now available, noncoherent light can be used with the associated reference source and a finely ruled interference screen to produce a spatial image which can be viewed from both the transmitted and reflected light sides. Dr. Komar explained that the first practical demonstrations of this system had just been achieved a few days before the opening of the Congress and that only a short monochrome film loop and a small screen viewable by three or four people at a time could be shown at their Cinema and Photographic Research Institute (NIKFI) in Moscow. Despite these limitations, delegates who saw the actual results were left with the sense of having been present at a historic occasion, comparable with the classic demonstrations of past pioneers in film and television and having equally vast and perhaps unrecognized potentialities.

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From left: André Coutant, President of Uniatec; Boris Konoplev, Chairman of the Congress; O. Ioshin, Director of NIKFI.

The present high achievement of the more conventional stereo cinema, using polarized images, was also to be seen at NIFKI on the same occasion. As is generally well known, the Russian "Stereo-70" system has the right- and left-eye images as a pair of frames, each slightly larger than standard 35mm full aperture, side by side on 70mm film. This is projected by a single projector with twin optical systems to give superimposed pictures on the metallized screen of a full-size cinema theater, and is viewed by the audience wearing individual polarizing glasses. The system was described in a paper at the Uniatec Conference by A. Boltyansky and others and the demonstration films shown on a 12-meter screen to a large audience of delegates in the NIKFI theater were breathtaking in their stereo characteristics combined with superb color and photographic quality. The range of cameras now available in the USSR for photography by this system is impressive, including both high-speed and lightweight mobile units, and it is hoped that its outstanding results will be seen in Western Europe before too long.

In the field of stereo pictures the conference program also included a paper from Charles Smith (U.K.) on the distortions occurring when small objects are enlarged in stereo because the perception of depth becomes exaggerated in proportion to width. Using slide demonstrations he emphasized the necessity of correcting such effects by the correct relations of the two camera lenses. Tung H. Jeong (U.S.A.) described and demonstrated the conversion of a suitable sequence of motion-picture frames into a series of hologram images placed as narrow strips on the surface of a transparent vertical cylinder. When illuminated from below by a normal light source a stereo image appears within the cylinder and if the cylinder is rotated or the viewer's eye moves around the circumference, the action of the original frame sequence is reproduced. Although not providing natural color, the system can be applied to technical or advertising uses where continuously repeating action is to be shown in depth.

Review Studies

Among the papers contributing overall

consideration of motion-picture philosophy, Pierre Clement (France) reviewed the effects of 75 years of scientific progress in the service of the cinema, ranging from the early improvements of photographic emulsions, through the introduction of color and sound to the current requirements of high sensitivity, finer grain and rapid processing. Lazlo Fuszfas (Hungary) considered the future of cinematography in 1990, combining computer-based extrapolation of current practice with imaginative exercises by students. Most of the points indicated — camera miniaturization zoom mirror optics, radio linkage for time coding and automated editing — appear already on the threshold of use and only the concept of screenless projection for aerial-image viewing was somewhat more remote.

Claude Leon (France), President of the Commission Supérieure Technique du Cinema, considered the relation of the filmed subject and its photographic image as analogous to the process of language translation and dealt with the visual equivalent of the nuances of verbal expression. In another survey paper, Robert Caridi (France) treated the photographic process as a coding/decoding system of information transfer, both in reversal and neg-pos operations, and drew attention to the possibilities offered by the capability of even more rapid processing.

Kenneth Mason (U.S.A.), SMPTE President at the time of the Congress, explained to the delegates the position and programs of the Society in its 60th Anniversary Year, both in relation to the many aspects of the motion-picture and television industries within the United States and in the international context, where its work on standardization through the ISO and its close links with equivalent technical societies in other parts of the world is widely appreciated.

Among the final papers of the conference was a lively contribution from Lars Svanberg (Sweden) under the title "Where do all the fancy revolutions go?" Despite many so-called revolutions, Lars pointed out that we are still concerned with only two media for picture and sound — film shown by way of a projector (going back to 1900) and television on an electronic tube (as from 1950). All the developments such as videocassettes and videodiscs, ENG, computer animation, tape-to-film transfer and the rest are changes of internal technology or distribution. And in some cases disappointment with a so-called "new" medium has led to the rediscovery of older, well established procedures. With the phrase "Art is the Mother of Technology," he suggested that human "dynamic conservation" plays an important part in determining

the application of new developments in motion-picture and television production where the creative artist is concerned.

Film Formats and Camera Usage

From the USSR, a paper by Drs. Bernstein, Wysotsky and Konoplev (read by Michael Wysotsky) on Image Formats reviewed the development of wide-screen frame size and the influence of television requiring the 4 X 3 proportion. The latest proposals for a universal non-anamorphic compromise were outlined, based on a full-frame exposure area on 35mm film, from which an image area 25 mm wide and not less than 11 mm high would be optically printed for cinema wide-screen presentation and the area 22.2 X 16 mm used to give contact prints for television use.

Rune Ericson (Sweden) described the present use of super 16 in Sweden; after covering the basic principles and economic advantages of the system, he illustrated the use of the Aäton camera with TV viewfinder by extracts from recent productions.

On behalf of Ed DiGiulio (U.S.A.), Milton Forman introduced the Steadicam stabilized mount for handheld camera operation, together with a striking series of demonstration films showing its use and the results, which were greeted with spontaneous applause from a large audience of delegates. Having been shown at Photokina and subsequently at the New York SMPTE Conference, this equipment has already been described for our readers.

In a paper from England, David Humphreys described the development of zoom lenses for film and TV cameras, through the 10:1 Varotal (25-250mm, $T/3.2$) to the Varocinetal for 16mm, also a 10:1 zoom, with minimum close-up position now down to 0.4 meter. Multirole zoom lens practice is now provided by a flexible selection of accessories to the basic 10:1 unit, consisting of variable front components, range extenders and 35/16 camera adapters. A new application of zoom optics to front-projection special-effects photography using a reflex screen couples the zoom lenses of camera and projector; the plate area seen by the camera lens is now correctly compensated during its zoom action on the foreground action so that false perspective effects are avoided.

Lighting Equipment

Modern developments in lighting were dealt with in a group of three associated papers: Kugler and Tillack (West Germany) described the current generation of lamps of the Metallogen (HMI) type from Osram, while R. C. Aldworth (U.K.) reviewed lamp forms and current operational experience with the

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compact source iodide (CSI) type of lamps produced by Thorn. On the theoretical side, Jahnke and Szekely (Hungary) provided a mathematical treatment of the flicker characteristics of metal halide lamps on ac supplies for filming at various frame rates, with a final preference for the use of higher-frequency supply systems as a desirable solution.

Under this general heading, we may also note the paper by Walker and Branch (U.S.A.) describing the latest Spectra Tricolor Meter for the assessment of light source color temperatures with an accuracy of ± 0.5 decamireds over the range 2500 to 30,000K. The instrument reads directly and by use of the associated Spectra Distribution Index and Filter Computer allows the color correction of all types of light sources to be rapidly carried out.

Sound

Stereo sound systems received renewed attention in Moscow. Tony Lumkin (U.K.) gave a paper on the practical developments of the Dolby-encoded system for compatible stereophonic optical tracks while Ioan Allen (U.S.A.) dealt with technical aspects of the equipment and its characteristics. Gabor Erdelyi (Hungary) described further experience and operating techniques in production for the dual-channel stereo soundtrack initially described at the 11th Uniatec Congress at Salerno in 1974. Production reels of both systems were demonstrated to a large audience of delegates in the NIKFI theater later.

Among several other papers dealing with sound and post-production operations, Karl-Heinz Trissl (West Germany) gave a full outline of the proposals for a time-code system for film and tape currently being studied by the European Broadcasting Union in cooperation with the Institut für Rundfunktechnik of Munich (the IRM-EBU system; EBU Technical Document 3096). Anselm Wucher (West Germany) described the latest model E in the Duo-cord range; a central sync generator and digital clocks, which can conform to the EBU time code, can control a whole group of operations linked to the recording system, including a continuous motion-picture projector with holoscope prism optics for either direct front projection or by way of a TV camera to multiple monitor screens. Videotape handling can be included and advance programming with high-speed location at up to 30 times operational speed is claimed.

D. Horvath (Hungary) compared the techniques used for re-recording theatrical and TV productions at the Pan-romania studios. Since TV is heard in the home with room volumes of 80-90 m³,

as compared with theatrical films in cinema halls of 2000 m³, it was decided to establish recording studios of 100-150 m³ for TV productions with appropriate acoustic absorption and resonators for short reverberation times.

A paper by Haber (Hungary) and Katcherovitch (USSR) dealt with the new sound stage for Mafilm Studios, where each year some 20 features, 400 shorts and 90 hours of TV programs are produced. This was a joint international project in which experts from NIKFI provided the technical design for a structure of 40,000 m³ total. Because of noise problems from a neighboring airport, a box-in-box structure with separated foundations had to be employed. On completion the initial reverberation time was found to be too long and string-instrument reproduction too dull, but subsequent adjustment of the variable-wall panels and the replacement of the PVC flooring with sprung wood reduced the midfrequency time to 1.3 seconds and provided satisfactory orchestral quality. The equipment installed is truly international — the main console by Neumann, the mixers by Neumann and HK, mobile mixing desk by Neve, recording equipment by Ampex and MWA with Dolby facilities.

V. Trtinjak (France) presented the new models of Schlumberger machines using 17.5 and 16mm perforated magnetic film for post-synchronization, mixing and sound transfer. These have an improved closed-loop capstan drive with electronic smoothing before and after; the latest Alfesil heads have high accuracy and a life up to 100,000 hours is claimed. The equipment may be coupled to telecine or projector by pilotone signal and the DS 16 model can operate with EBU coding. An internal converter allows strict synchronization at either 24 or 25 pps to be selected and rewinding takes place at 10 times normal speed.

B. Urbankova (Czechoslovakia) described the use of synthetic sound for non-realistic effects at the Barrandoff studios and Paolo Ketoff (Italy) treated some aspects of sound dynamic range and the use of compressors and limiters in order to minimize masking effects in recording mixed sound sources, preferably with separate compressors for individual groups of orchestral instruments.

Production Operations

Production practices for shooting TV color films in Czechoslovakia were described in a paper by Kreici and Goffman; standardized operations derived from previous cinematograph procedures have been established, including tolerances for the color temperatures of light sources and a formal basis of

exposure based on the use of a 1° spot brightness meter. A standard ten-step gray scale having subjective nonlinear intervals from TV white (1) to TV black (10) has been related to the characteristic curves of the film stocks in use.

From Romania, Georges Radu reported the influence of new materials such as fiberglass polyester and polyolefin plastics and vulcanized latex in the studios of Romaniafilm, while another paper by Lotreanu and others dealt with the optimum use of their stages for theatrical and TV production.

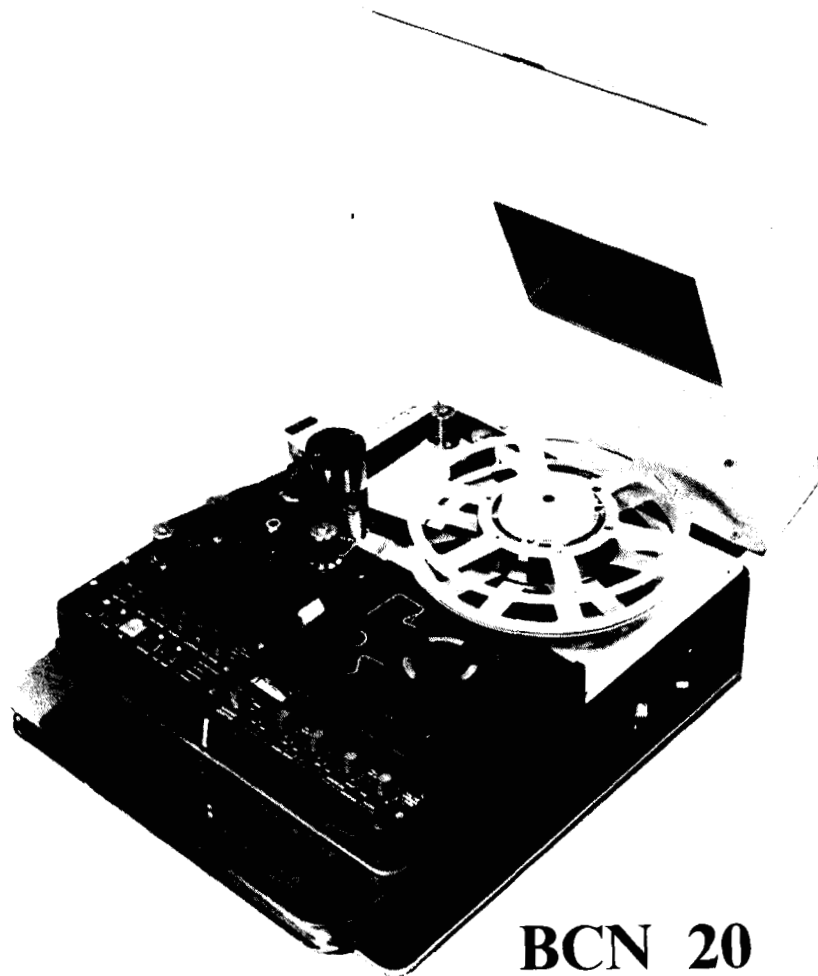
A truly international contribution by Milton Forman (USA) provided a critical assessment of studio stage designs based on the world-wide survey which he undertook on behalf of the Motion Picture and Television Research Centre. It seemed clear that in the past there had been some instances of over-elaboration in design with disproportionate sophistication for remote control and automation of equipment handling, to the point where capital and maintenance costs were excessive for the level of operation. Unduly complex overhead grid structures required extremely expensive construction and were sometimes found more limited in flexibility than was desirable. It was interesting to note that the new Goldwyn stages in Hollywood had returned to a comparatively simple wooden grid in a lighter structure and were intended to be flexible enough to meet the varying demands of individual film and TV directors without mechanical restriction.

The organization and operation of the film coverage of the 21st Olympic Games in Canada was outlined by Karl Ludvik of the Olympic Radio and Television Organization (ORTO) established to provide international services. Extensive film coverage in addition to television was necessary both to produce a 20-min daily summary film for international issue and to cover the many activities outside the Montreal area for which TV coverage was inconvenient. There were in fact 39 Eclair ACL cameras and 3 high-speed cameras in daily use, while three special laboratories and 20 film-editing rooms were set up in Montreal and Kingston to provide front-end services around the clock, although the printing of completed material was carried out by commercial laboratories.

Laboratory Equipment

Harry Teitelbaum (U.S.A.) introduced the latest model of HFC panel printer with in-built microprocessor, together with their new film cleaner/rejuvenator, which resurfaces both base and emulsion sides to cure scratches and abrasions. Anton Vajner (Czechoslovakia) described the design of a 35mm

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General Assembly meeting. In foreground: Claude Soulé, Secretary General; André Coutant, Boris Konoplev. Rear row: Robert Gale, David Samuelson (U.K.), Guido Marpicati (Italy) and other members of the Uniatec Council.

contact intermittent printer for color intermediates with additive lamphouse compatible with the Bell & Howell continuous machine. Stepping motors are used for the light-valve positioning, with electronic verification of opening. The combined modulated beams enter a prismatic optical-integrating bar producing full-aperture illumination at the printing gate.

A new form of additive light control was reported by Y. Yasny (Poland) in which a single light source illuminates a circular area divided into three 120° sectors of red, green and blue filters; three pairs of scissor-action shutters move across the sectors to modulate the transmission of each color and an optical-integrating bar is again used to produce uniform light from the area modulation.

Mario Calzini (Italy) described the solution of problems in running an OMAC demand-drive developing machine at high speed by applying the drive directly to the whole width of the soft-touch-tire film rollers instead of restricting it to the pulley rims. This "ultra-drive" system is now in operation in the new laboratory at Cinecitta, Rome, for combined 35 and 16mm processing at speeds up to 6000 meters/hour. From East Germany, Dittrich, Grussnet and Keiler contributed a detailed study of the measurement and recording of developing time as a method of photographic process control. An impulse system allows the interval from solution entry of the film

to subsequent washing and fixing stages to be accurately recorded to 0.1 s for a number of developing machines with display and print-out at a central station.

Because of the limited tonal range of the original copy in cartoon films (40:1 compared with live action 160:1) it is desirable to increase the color contrast in the resultant film. C. Ondrejcsik of Romania described how this was done using color negative type NC-3, whose contrast varies with developing time. The studio must of course be aware of the effect of this process and select the tones to be reproduced as extreme whites and blacks accordingly.

From Czechoslovakia, Vauches Novak reviewed photographic and laboratory-processing special effects which could perform for film some of the electronic tricks now popular in TV. These included monochrome to color transitions, desaturation, uniform colorization at selected density levels, transposed color records, negative imaging, solarization, and relief effects by image displacement. Examples of these effects were shown.

Miscellaneous Items

Several papers dealt with subjects near the interface of film and television practices. For example, Serge Vidal (France) described the new flying-spot telecine machine TTV 2520 by Thomson-CSF, which employs an oscillating mirror for the correction of continuously moving film, the film perforations providing a

stabilizing signal by way of a grid image. The general arrangement is vertical, as in regular broadcast equipment racks, with the monitor screen at the top and 16mm film can be used either in 300-meter cassettes or in 1200-meter reels, with automatic threading in both cases. High-speed forward and reverse search is provided and the programmable color-correction console can be set to use color negative film if required.

Dr. Frank Gloyns (U.K.) gave a detailed outline of the 3-color laser beam system by CBS for transferring videotape to film now operated by Rank Video in London, while Bernard Happé (U.K.) briefly summarized the other currently available methods for this operation — direct photography of shadow-mask tube, or trinoscope, or by way of separation records, including both photographic and electron beam recording. Sixteen-millimeter film examples of nine different processes available in the United States, England and Sweden were demonstrated. Georges Broussard (France) explained the Thomson-CSF Videodisc system and pursued some of its proposed future applications and exploitation.

Scientific Studies

In the space available, it is impossible to do more than mention very briefly some of the topics covered by the more purely scientific papers at the conference. A number were concerned with methods for the evaluation of picture quality — Mehnert and Pauli (East Germany), Barna (Hungary) — and color reproduction in film and television — Krahmann (West Berlin), Richter (West Berlin), Polenz (East Germany). Grebennikov (USSR) dealt with the application of sampling theory to the cinematographic process, providing a mathematical treatment of stroboscopic effects and the psychophysics [biophysics] of flicker perception. The wealth of material available was indicated by a summary given on the last day by Dr. Bongard of NIKFI, in which he summarized some fifteen further papers on film and television science which it had not been possible to include in the papers program given during the preceding five days. All these will, however, be included in the Proceedings of the entire Congress.

BERNARD HAPPE